

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of all claims in the application.

Listing of Claims

1. (Original) ~~A method of identifying suitable polymer attachment sites on a protein generating a protein with a polymer attached at a favorable attachment site comprising:~~

a) inputting a three dimensional protein structure with amino acid positions into a computer; and

b) analyzing said structure using a simulation module that:

i) identifies a set of said positions suitable for attachment of a polymer; and

ii) identifies a set of possible polymers;

to generate a matrix of positions and polymers that are energetically favorable; and

c) physically making and screening at least one protein with said polymer attached at said favorable attachment site.

2. (Original) A method according to claim 1 wherein said set of polymers are polymeric conformers.

3. (Original) A method according to claim 1 wherein said set of polymers is generated by chain buildup.

4. (Original) A method according to claim 1 wherein said set of polymers is generated by utilizing a starting polymeric conformer and perturbing said conformer to generate said set.

5. (Original) A method according to claim 4 wherein said perturbation is done using a Monte Carlo search.

6. (Original) A method according to claim 4 wherein said perturbation is done using a molecular dynamics method.

7. **(Original)** A method according to claim 1, wherein said protein is a therapeutic protein.
8. **(Original)** A method according to claim 1, wherein said polymer is pharmaceutically acceptable.
9. **(Original)** A method according to claim 1, wherein said polymer is PEG.
10. **(Original)** A method according to claim 1, wherein said polymer has a range of about 1000 daltons to about 100,000 daltons.
11. **(Original)** A method according to claim 1, wherein said polymer is branched.
12. **(Original)** A method according to claim 1, wherein said polymer is unbranched.
13. **(Original)** A method according to claim 1, wherein said polymer is labile.
14. **(Currently amended)** A method according to claim 1, wherein said simulation module includes [[MC]] Monte Carlo, [[MD]] molecular dynamics or combinations thereof.
15. **(Original)** A protein with a polymer attachment generated by the method of claim 1.